

1399 990

- (21) Application No. 46362/73 (22) Filed 4 Oct. 1973  
 (31) Convention Application No. 2249493 (32) Filed 10 Oct. 1972 in  
 (33) Germany (DT)  
 (44) Complete Specification published 2 July 1975  
 (51) INT CL<sup>2</sup> G01N 1/14  
 (52) Index at acceptance  
 B8N 8



## (54) SAMPLING APPLIANCE FOR GRAIN

(71) We, EINFUHR- U. VORRATS-  
 STELLE FÜR GETREIDE UND FUT-  
 TERMITTEL, a German Anstalt des öffent-  
 lichen Rechts, of Adickesallee 40, 6000  
 5 Frankfurt am Main 18, Federal Republic of  
 Germany, do hereby declare the invention,  
 for which we pray that a patent may be  
 granted to us, and the method by which it  
 is to be performed, to be particularly des-  
 10 cribed in and by the following statement:—  
 The invention relates to a sampling  
 appliance which is used particularly for grain.  
 For the appraisal and examination of grain  
 shipments it is necessary to take samples at  
 15 arbitrary points of the store. For this purpose  
 so-called single-chamber and multi-chamber  
 probes are used which are introduced  
 manually into the loose bulk material. The  
 use of these probes involves high expenditure  
 20 of energy and is limited by the displacement  
 resistance, which increases with depth.  
 The consequence of this is that inspection  
 of the stocks or sampling is not possible at  
 all in the case of heaps having a height of  
 25 more than 3 metres.  
 The present invention has the object of pro-  
 ducing a sampling appliance which is con-  
 venient to operate and with the aid of which a  
 rapid and clean sampling can be carried out,  
 30 and even heaps having a heap height of 5—6  
 metres, now frequently achieved, can be  
 sampled.  
 In accordance with the invention a  
 sampling appliance comprising an extensible  
 35 suction pipe one end of which forms a mouth-  
 piece and the other end of which is connected  
 through a flexible hose with a blower and  
 a separator, and a container for collecting  
 material entrained in the air stream induced  
 40 in the pipe by the blower and removed there-  
 from by the separator, the blower, the  
 separator, and the container being mounted  
 on a carrier frame to provide a portable unit  
 to be carried like a rucksack or back pack, and  
 45 the pipe comprising a plurality of pipe pieces  
 which are detachably assembled.  
 In order to achieve the most uniform pos-  
 sible sucking over the entire height of the

heap, it is preferred that the mouthpiece  
 of the pipe has a quantity-regulating spiral. 50  
 It further contributes to the uniform sampling  
 if bores or auxiliary entry holes are arranged  
 in the region of the mouthpiece in the pipe.  
 Finally the use of a double pipe ensures  
 that the quantities of air necessary for the 55  
 transport of the sample are always available  
 to an adequate extent.  
 The invention will be described in greater  
 detail hereinafter with reference to an em-  
 bodiment which is illustrated in the accom- 60  
 panying drawings, wherein:—  
 Figure 1 shows a portable sampling  
 appliance according to the invention;  
 Figure 2 shows a perspective view of a 65  
 double-walled pipe;  
 Figure 3 shows the mouthpiece of a single-  
 walled pipe, partially in section;  
 Figure 4 shows a view of a pipe piece  
 serving for extension;  
 Figure 5 shows a lateral view of the part 70  
 of the appliance consisting of blower,  
 separator and container and  
 Figure 6 shows a further rear view of the  
 same part.  
 The portable sampling appliance as illus- 75  
 trated in Figure 1 consists of an extensible  
 pipe 2, of which one end or mouthpiece 3  
 is open and the other end 4 is connected  
 through a flexible hose 5 with a blower 8  
 comprising a separator 6 and a container 7. 80  
 The part of the appliance consisting of  
 blower 8, separator 6 and container 7 is  
 portable and has for this purpose a carrying  
 frame 9 so that it can be transported like a  
 rucksack. The hose 5, as appears especially 85  
 from Figure 6, is connected with the suc-  
 tion connection 10 of the blower 8 so that  
 a negative pressure always prevails in the  
 pipe 2. Thus the sample is taken up at the  
 mouthpiece 3 and entrained by the air flowing 90  
 to the blower 8 and the separator 6.  
 The pipe 2 is assembled from several pipe  
 pieces 11 which have bayonet catches 12 on  
 their ends, serving for securing. In the taking 95  
 of the sample the mouthpiece 3 of the pipe  
 2 is pressed by hand deeper and deeper into

the heap as the material is sucked away, it being necessary to attach fresh pipe pieces 11 in each case at the end 4 of the pipe 2, until samples situated at the bottom of the heap are also sucked away. The hose 5 must in this case be removed repeatedly from the pipe 2, so that the necessary pipe pieces 11 can be inserted. The hose can advantageously further be fitted in airtight manner onto the pipe 2 or the pipe pieces 11, and easily released again.

According to Figure 3 on the free end of the mouthpiece 3 there is a quantity-regulating spiral 12 with the aid of which an especially uniform and continuous taking of the sample is achieved. It prevents a column of grain from rising without the flow cross-section being substantially reduced. Finally if auxiliary bores 13 are provided also in the region of the quantity regulating spiral 12 in the pipe 2, an even better flow of the grain is obtained.

When a quantity-regulating spiral 12 is used, the expenditure of force and the tendency to blockage are at the minimum, and at the same time a favourable quantity-regulation and a continuous conveying operation are achieved.

As a rule in the interior of the heap there is plenty of air which can transport the sample after the generation of a negative pressure at the mouthpiece 3. However for the case where the air quantity does not suffice, a double-walled pipe 14 is used through the internal pipe 15 of which the grain is sucked away while the compensating air necessary to maintain the transport operation can flow in through the outer pipe 16.

With the aid of the sampling appliance any grain store can be examined rapidly and reliably and all damaged parts, floor adhesions or water penetration can be located or defined exactly in dimensions. Furthermore it is now possible to utilise the storage spaces further since the heap height is no longer limited by the working range of the sampling appliances known hitherto.

#### WHAT WE CLAIM IS:—

1. A sampling appliance comprising an extensible suction pipe one end of which forms a mouthpiece and the other end of which is connected through a flexible hose with a blower and a separator, and a container for collecting material entrained in the air stream induced in the pipe by the blower and removed therefrom by the separator, the blower, the separator, and the container being mounted on a carrier frame to provide a portable unit to be carried like a rucksack or back pack, and the pipe comprising a plurality of pipe pieces which are detachably assembled. 50
2. A sampling appliance according to claim 1, wherein the mouthpiece of the pipe contains a quantity-regulating spiral. 55
3. A sampling appliance according to claim 2, wherein the pipe has auxiliary entry holes in the region of the quantity-regulating spiral. 60
4. A sampling appliance according to claim 1, 2 or 3, in which the pipe is a double pipe, the inner and outer pipe walls being arranged concentrically with one another. 65
5. A sampling appliance according to any of claims 1—4, wherein the pipe and the hose are connected with a suction connector of the blower. 70
6. A sampling appliance according to any of claims 1—5, wherein the pipe pieces forming the pipe are connected with one another by a bayonet catch. 75
7. A sampling apparatus constructed and arranged substantially as hereinbefore described and shown in the accompanying drawings. 80

D. YOUNG & CO.  
Chartered Patent Agents  
9 & 10 Staple Inn  
London, WC1V 7RD  
Agents for the Applicants 85

1399990

COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale  
Sheet 1

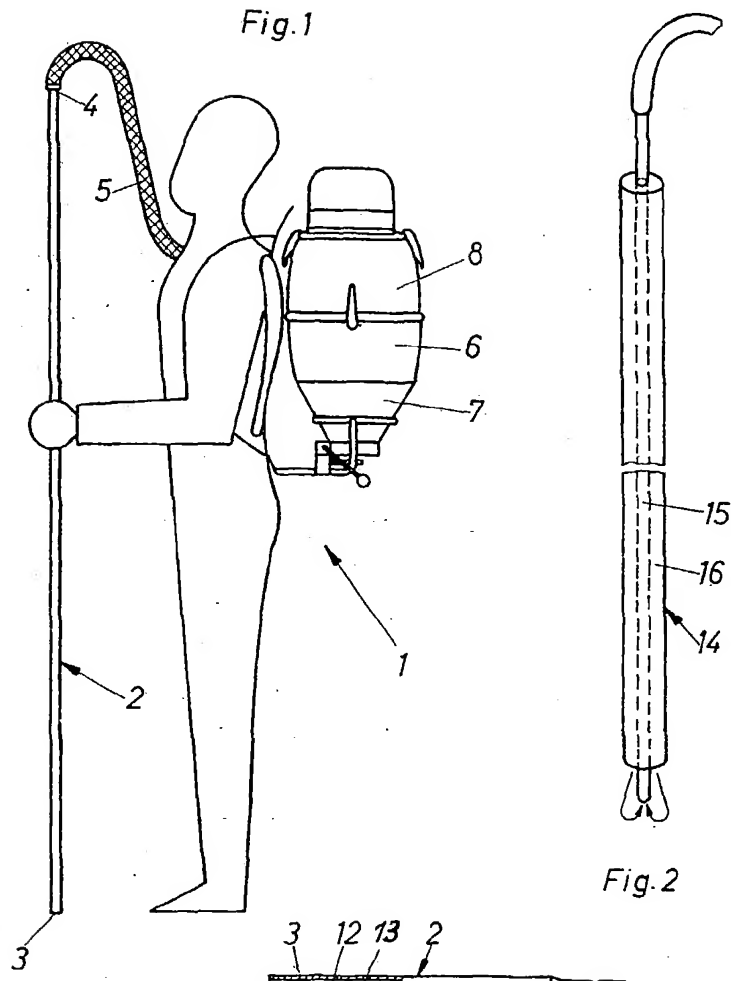


Fig.3

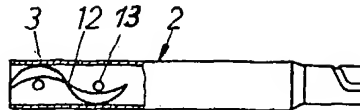


Fig.4

